



Rewarding Learning

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 2 (Chemistry)

Foundation Tier

[GSS21]



THURSDAY 14 NOVEMBER 2013, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

Quality of written communication will be assessed in Question 9.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Data Leaflet, which includes a Periodic Table of the Elements, is included in this question paper.

Centre Number

71

Candidate Number

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total Marks



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2 Aluminium is used to make aeroplanes.



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(a) What makes aluminium suitable for use in aeroplanes?
Tick (✓) **two** properties from the list below.

- Low density
- Strong
- Electrical conductor
- Soft
- Heat conductor

[2]

(b) Cotton, wool and silk are all examples of natural materials. What is meant by the term **natural material**?

[1]

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Marks	Remark

(c) Glass fibre can be used to make car bodies. It combines the properties of two or more materials to make a more useful material.

What name is given to this type of material?

Circle the correct answer below.

ceramic : **composite** : **nano-material** [1]

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Marks	Remark

3 Fingerprints can be used to help fight crime.

(a) Name the two types of fingerprints shown below.

Choose from:

whorl

composite

loop

arch

(i)



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_____ [1]

(ii)



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_____ [1]

(b) Name a powder used to dust for fingerprints on a **white** surface.

_____ [1]

(c) Explain fully why fingerprint evidence is useful in solving a crime.

_____ [2]

Examiner Only	
Marks	Remark

- 4 (a) Below are some chemicals and household substances. Using lines, match each chemical to the household substance in which it is found.

One has been done for you.

Chemical	Household substance
magnesium hydroxide	Milk of Magnesia
ethanoic acid	lemon juice
citric acid	drain cleaner
sodium hydroxide	vinegar

[2]

- (b) The table below gives the soil pH that some plants grow best in.

Name of plant	pH of soil
Apple	5.0–6.5
Blackcurrant	7.5–8.5
Potato	5.5–6.5
Beetroot	6.0–8.0
Cabbage	9.0–10.0

- (i) Name the plant that grows best in the most alkaline soil.

_____ [1]

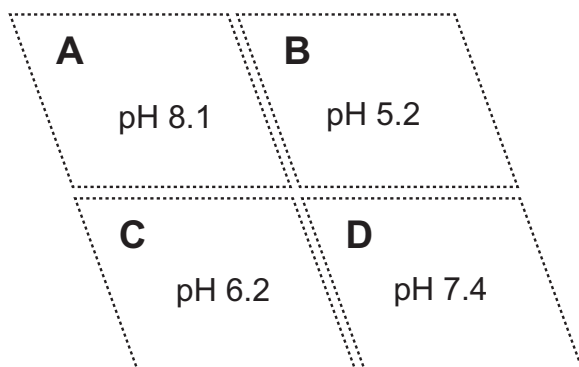
- (ii) Name the plant that is best suited to grow in both acid and alkaline soils.

_____ [1]

Examiner Only

Marks Remark

A farmer tested the pH of the soil in his fields (**A**, **B**, **C** and **D**). His results are shown below.



(iii) He wants to grow potatoes. Which field (**A**, **B**, **C** or **D**) should he use? Explain your answer.

Field _____

_____ [2]

(iv) He also wants to grow strawberries in field **B**. Strawberries grow best in soil with a pH of 7.

Explain fully why he needs to add lime to the soil in field **B**.

_____ [2]

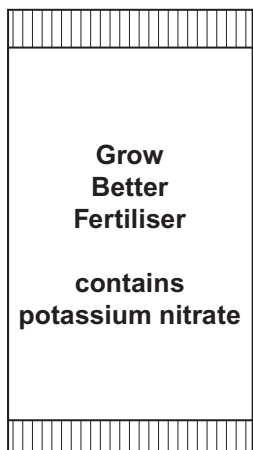
(v) What is the name given to a substance with a pH of 7?

_____ [1]

Examiner Only

Marks Remark

(c) Farmers add fertiliser to their soil to help their plants grow better.

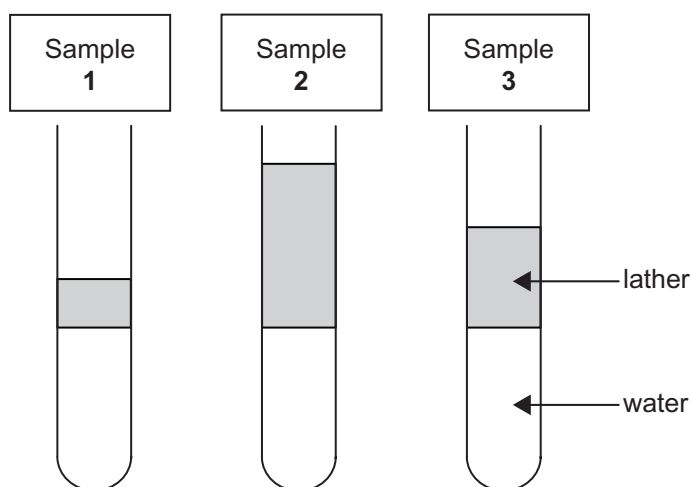


Potassium nitrate (KNO_3) contains potassium and two other elements.
Name the other **two** elements.

_____ and _____ [2]

Examiner Only	
Marks	Remark

- 5 A student investigated the hardness of three samples of water. She added 5 drops of soap solution to 10 cm^3 of water and shook for 10 seconds. Her results are shown below.



- (a) Explain **one** way in which the student made this a fair test.

_____ [1]

- (b) Name a piece of apparatus she could have used to measure 10 cm^3 of water.

_____ [1]

- (c) Which sample (1, 2 or 3) contained the hardest water?

_____ [1]

- (d) Circle the compound that may cause hard water.

calcium sulfate : **iron sulfafate** : **copper sulfafate** [1]

Examiner Only

Marks Remark

- 6 The table below shows some waste materials produced in Belfast in one year.

Material	Waste produced/ tonnes
paper	16 500
plastic bottles	4 500
glass	6 000
food and garden waste	33 000
aluminium cans	3 500
cardboard	7 500

- (a) In Belfast 50% of the paper waste is recycled.

Calculate the number of tonnes of paper waste that is recycled in one year.

(Show your working out.)

_____ tonnes [2]

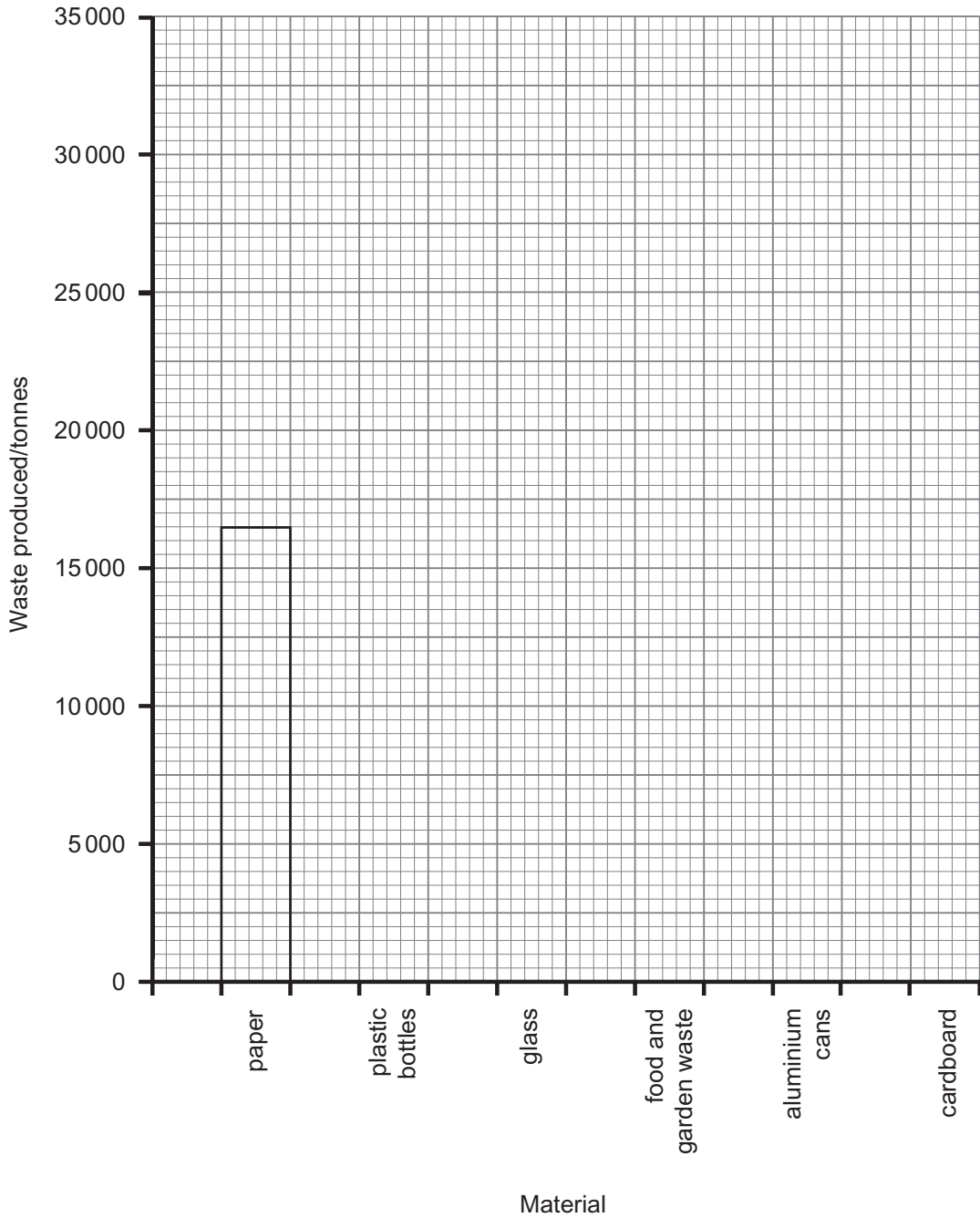
- (b) Give **one** advantage of recycling.

_____ [1]

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Marks	Remark

(c) Complete the bar chart below for this information.

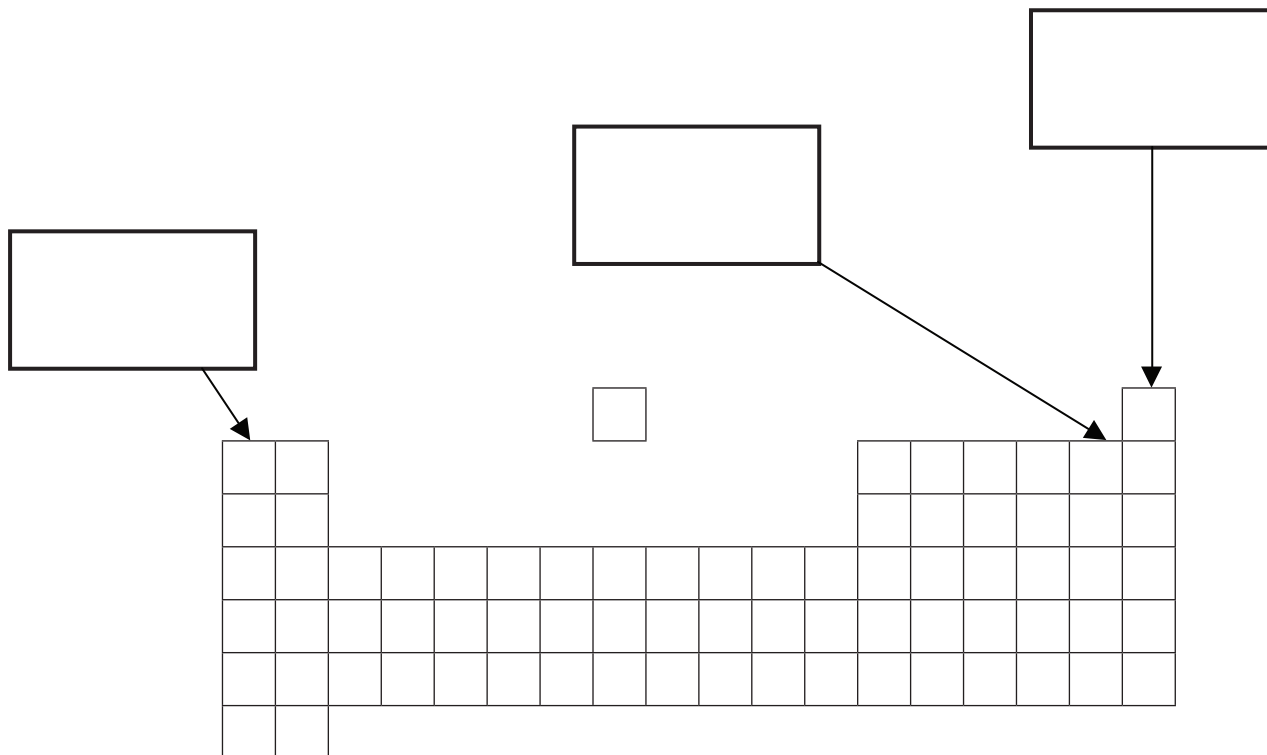
Examiner Only	
Marks	Remark



[2]

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7 Below is an outline of the Periodic Table.



(a) On the diagram above complete the three boxes to name the Groups of the Periodic Table shown.

Choose from:

alkaline earth metals : halogens : alkali metals : noble gases [3]

(b) Name the scientist who developed a Periodic Table most similar to the one outlined above.

_____ [1]

(c) Complete the following sentence to describe a **trend** in the Periodic Table.

The metallic character of the elements _____ from left to right across the Periodic Table. [1]

Examiner Only	
Marks	Remark

- 8 A student investigates the reactivity of four metals: iron, magnesium, zinc and tin.

He added 1 g of each powdered metal to equal volumes of copper sulfate solutions and measured the temperature rise. The larger the temperature rise the more reactive the metal.

The results are shown below.

Metal	Starting temperature/ °C	Highest temperature/ °C	Temperature rise/ °C
iron	20	52	32
magnesium	21		50
zinc	19	60	41
tin	20	41	21

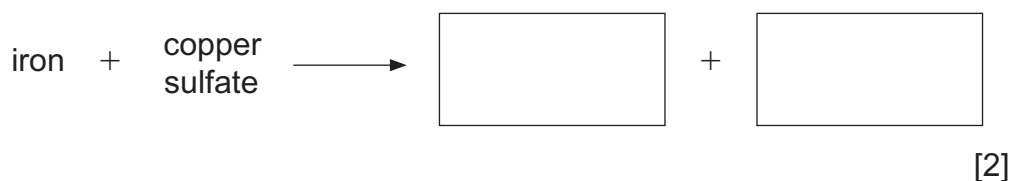
- (a) Calculate the highest temperature for the reaction with magnesium.

_____ °C [1]

- (b) Name the metal in the table that is the **least** reactive.

_____ [1]

- (c) (i) Complete the word equation for the reaction between iron and copper sulfate.



- (ii) What is the name given to this type of reaction?

_____ [1]

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Marks Remark

(d) The student carried out the same experiment using 1 g of powdered silver metal. There was no temperature rise. Suggest a reason why there was no temperature rise.

_____ [1]

(e) The chemical formula for copper sulfate is CuSO_4 .

(i) How many elements are present in copper sulfate?

_____ [1]

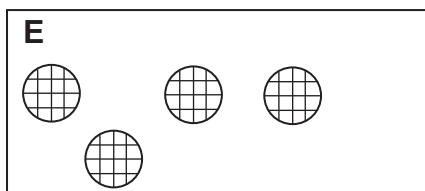
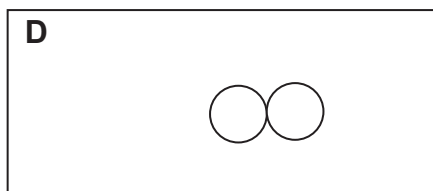
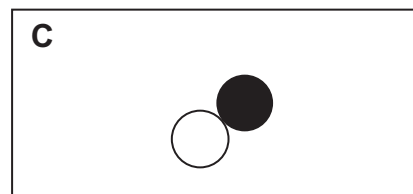
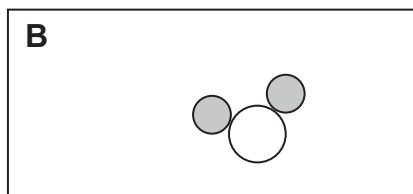
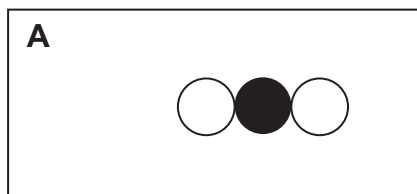
(ii) How many atoms are represented in this formula?

_____ [1]

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Marks Remark

10 Shown below are some particle diagrams that represent elements or compounds.



- (a) Which particle diagrams (**A, B, C, D** or **E**) show compounds? Explain your answer.

Diagrams _____

_____ [2]

- (b) Atoms of argon do not join with any other atoms. Which diagram (**A, B, C, D** or **E**) best represents argon?

_____ [1]

- (c) Carbon monoxide has the formula CO. Which diagram (**A, B, C, D** or **E**) best represents carbon monoxide?

_____ [1]

- (d) Hydrogen atoms are smaller than any other atoms. Which diagram (**A, B, C, D** or **E**) best represents water (H₂O)? Explain your answer.

 _____ [2]

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Marks	Remark

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